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In spite of these exceptions, the agreement of the solar and terrestrial lists is such as to confirm very strongly Rowland's opinion that, if the earth's crust should be raised to the temperature of the sun's atmosphere, it would give a very similar absorption spectrum. A moderate admixture of meteoric material would make the similarity even closer.

In conclusion, the writer desires to express his very hearty thanks to Dr. Clarke, for valuable information on the geochemical side of the problem, and for the suggestion that the comparison here made (which has been given in the writer's lectures for several years) may contain enough that is unfamiliar to justify its publication.

HENRY NORRIS RUSSELL

PRINCETON UNIVERSITY OBSERVATORY,

May 5, 1914

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

SECTION K—PHYSIOLOGY AND EXPERIMENTAL MEDICINE

At 4:30 o'clock on the afternoon of Friday, January 2, 1914, Section K met at the Atlanta Medical College, Atlanta, Georgia, with Vice-president Theodore Hough in the chair. The address of the retiring Vice-president, Dr. John J. R. Macleod, entitled, "The Physiological Instruction of Medical Students," was read by title owing to the lateness of the hour.

The Section then began the symposium on the subject of pellagra. The first speaker, Dr. J. W. Babcock, superintendent of the State Hospital for the Insane, at Columbia, S. C., spoke on the "Medico-Legal Relations of Pellagra." Dr. Babcock has not sent to the secretary an abstract of his remarks.

Captain J. F. Siler, of the U. S. Army Medical Corps, Dr. P. E. Garrison, U. S. N., and Dr. W. J. MacNeal, assistant director of laboratories, New York Post-Graduate Medical School, presented a paper read by Dr. MacNeal entitled, "Further Studies of the Thompson-McFadden Commission on the Etiology of Pellagra." An abstract follows.

"The Entomological Aspects of the Pellagra Investigation of the Thompson-McFadden Commission" was presented by Mr. A. H. Jennings, of the Bureau of Entomology, U. S. Department of Agriculture, Washington, D. C.

Report of the Thompson-McFadden Pellagra Commission:

Information concerning the age and sex, occupations, location of domicile, general dietary habits and concerning the existence of pellagra was obtained upon about five thousand persons by a house-to-house canvass of six cotton-mill villages. A similar study was carried out in one rural district of four square miles in which several cases of pellagra had occurred. Many other communities were studied in less detail. There was no definite relation observed between the occurrence of pellagra and the use of any particular foods. New cases developed for the most part in the immediate vicinity of old cases or after close association with them. In districts completely equipped with water carriage systems of sewage disposal, we found pellagrins who had acquired the disease before moving to these districts. Cases apparently originating in these sewered districts were extremely rare and their origin there somewhat doubtful.

These observations strongly suggest that unsanitary methods of sewage disposal have an important relationship to the spread of pellagra. If these indications can be confirmed in other places, we feel that the proper correction of these conditions by the installation of water carriage systems of sewage disposal will go far toward restricting the spread of the disease.

The exact mode of transmission of pellagra is still uncertain and we strongly urge the continued study of food contamination, of insects as transmitting agents and of close personal association as possible factors in its spread.

Summary of Two Years' Study of Insects in Relation to Pellagra: ALLAN H. JENNINGS.

The results of a study by the writer and W. V. King, in cooperation with the Thompson-McFadden Pellagra Commission in Spartanburg county, S. C., are here summarized, the observations and conclusions referring to conditions in that region except where otherwise stated.

Infectiousness of the disease and its transmissibility by blood-sucking insects were assumed, purely as a necessary basis for our work.

A high percentage of female cases, especially among home-frequenting individuals and among children of both sexes is a marked characteristic of the disease, a transmitter which is active by day being thereby indicated.

The characteristics of the insects studied justify

the incrimination of the biting stable fly, *Stomoxys calcitrans*, alone. These characteristics and the species studied are given below.

The distribution of pellagra and its occurrence in persons seemingly not exposed to attack by lice, possibly, also, the sex incidence, are not satisfactorily explained by their incrimination.

Bed bugs, though abundant, fail to account for the sex incidence of pellagra, while the habits and scarcity of horse-flies exclude them.

The prevalent mosquitoes, *Culex quinquefasciatus* (= *fatigans*) are nocturnal in habit and the day-biting *Aedes calopus* is of irregular occurrence in the region.

The human flea, *Pulex irritans*, is rare or wanting in the county. Fleas of animals cause little annoyance and they do not explain the sex incidence.

Simulium species do not associate with man and pellagra sufferers are usually rarely exposed to their attack. They are negligible as a pest of man in the region. Pellagra occurs, also, in regions from which they are absent.

Sand flies (Chironomidae), if present, are not a pest in the region.

The stable fly is a practically cosmopolitan and abundant species; it associates with man, invades his dwellings and attacks him freely; it bites by day and its longevity is considerable. Human blood has been determined in the stomachs of an important percentage of individuals and human blood may be drawn without pain, in many instances.

If the cause of pellagra is an intestinal bacterium, the house fly may very probably be a vehicle for its diffusion.

The house-infesting roaches, in this event, may also play a minor part.

Discussion of Pellagra—Mental Disturbances: E. BATES BLOCK, M.D.

There is no one type of mental disturbance characteristic of pellagra. Insanity is usually a late manifestation of the disease and when it occurs it usually means that the end is near. As a terminal event it usually assumes the type of the infective exhaustive psychoses, with clouding of the consciousness, confusion, hallucinations and changing delusions, with marked restlessness and apprehensiveness.

When the insanity occurs earlier in the disease before the exhaustion becomes marked, it is usually characterized by great depression with delusions which are depressive or persecutory in character. This is associated with marked apathy or restlessness

and general nervousness and insomnia, and sometimes with excruciating headaches. Mental confusion is quite common; apprehensiveness is often a marked feature of the disease. Suicidal attempts are quite common, but in only one of the cases which I have seen has there been any violence towards others.

Sometimes the insanity precedes the physical signs of pellagra as a part of the disease. While insanity does not confer immunity to pellagra and the sequence may have been accidental, I have seen several cases which have developed insanity suddenly and were so shortly followed by symptoms of acute pellagra that I believed them to be a part of the same disease. One of these was apparently typically psychasthenia, another melancholia, while a third was apparently manic depressive insanity, but all were quickly followed by the typical signs of pellagra. The prognosis in these cases is much more favorable than in the cases in which the insanity developed as a late manifestation of the disease. Occasionally the apathy is so great as to suggest dementia præcox and the cases of this type that I have seen have run a very chronic and protracted course.

The development of insanity is not necessarily of fatal significance. In one of my cases the patient has remained perfectly well now for eight years and in another for five years, without any recurrence either of mental or physical symptoms.

The *prognosis of pellagra* was discussed by Dr. George M. Niles, of Atlanta, Ga., as follows:

My experience in the treatment of over six hundred cases of this malady has made me somewhat optimistic, and I feel that the attitude of extreme pessimism assumed by some observers is unjustified.

Pellagra, like some other diseases, seems more virulent when implanted on virgin soil. We note that in the Old World, where it has been rife for nearly two centuries, the mortality is not near so great. In this country it is in many respects a new enemy, and its prospective victims have not been able to establish, as it were, any form of immunity against its ravages.

In my professional intercourses with pellagrins and their inquiring friends I have adopted a classification as to the conditions in which a favorable outcome may be anticipated, or the reverse. There are four classes in whom I am extremely chary in holding out a favorable prognosis: First, pellagrins over fifty or fifty-five years of age. The pathologic changes of this disease closely simulate those of senility, and when to the changes

due to weight of years are added like burdens due to disease, Nature can not hope to successfully contend with both. Second, confirmed alcoholics. These unfortunates seldom recover from pellagra. Third, cases in which the mentality is seriously impaired. These psychic changes indicate marked destruction of important nerve centers, and render the prognosis doubtful. Fourth, that class of intellectual weaklings who have neither the intelligence nor pertinacity to faithfully hold to and observe a course of treatment for months or years, if necessary, but who are continually shifting from one to another, or taking the nostrums of quacks and charlatans. Practically all of this fourth class succumb.

On the other hand, those who are not included in the classes just mentioned, who will zealously and patiently carry out the medicinal, dietetic and hygienic rules of those physicians who are experienced in the care of such cases, the hope of ultimate and permanent recovery may be confidently grasped by the large majority.

Let me in closing admonish my hearers that the keynote in the treatment of pellagra is *optimism*. If the patient can be kept in good spirits, and in a consistently hopeful frame of mind, the higher centers, untrammelled by fears or obsessions, can best exert their beneficent influence over the lower centers, vegetative and otherwise, and with a brighter hope of victory can we combat this dreaded scourge.

L. O. HOWARD,
Secretary pro tem.

THE AMERICAN PHYSICAL SOCIETY

A REGULAR meeting of the Physical Society was held at the Bureau of Standards, Washington, April 24 and 25, 1914. This was a joint meeting with the electrophysics committee of the American Institution of Electrical Engineers. The programs of the two morning and of the Saturday afternoon sessions were in charge of the Physical Society with President Merritt in the chair. The Friday evening session was in charge of the A. I. E. E. with Chairman J. B. Whitehead in the chair. The Friday afternoon session was given to a lecture by Sir Ernest Rutherford, F.R.S., of the University of Manchester, Eng., "On X-ray and Gamma-ray Spectra," complimentary to the American Physical Society.

Special features of the meeting were the opening of the new electrical building of the Bureau of Standards and an exhibit of physical apparatus. This exhibit was arranged under the direc-

tion of a committee of the American Physical Society with Dr. F. A. Wolff as chairman. It was a large and representative exhibit, participated in by thirty-two manufacturers, importers and industrial research laboratories, ten universities and educational institutions, and eight federal scientific bureaus.

Members of the Physical Society were especially invited by the National Academy of Sciences to attend the William Ellery Hale lectures by Sir Ernest Rutherford, F.R.S., upon "The Constitution of Matter and the Evolution of the Elements." These were given in the auditorium of the National Museum on April 21 and 23, and were attended by a large number of the Physical Society members.

All in attendance at the meetings were the guests of the scientific staff of the Bureau of Standards at luncheon on both days of the meeting. After the Friday evening session the local branch of the A. I. E. E. gave a smoker which was largely attended.

At a short business session of the Physical Society the following items of business were transacted:

On recommendation of the council, it was voted to establish a new grade of foreign members, to be defined as non-residents of North America, to pay dues of \$4.00, with no initiation fee and to receive the *Physical Review* (with *Science Abstracts* on additional payment of \$2.00) and having all rights of regular members in the society. Also, to make such changes in the by-laws as the establishment of this new grade of membership would necessitate.

On motion it was voted to approve and authorize an International Congress of Physics to be held in Washington in October, 1915, in case it should appear that it can be properly financed. (A committee of nine was appointed by the Council to determine this question).

It was voted that the president appoint a committee of three to express the deep sense of loss felt by the members of this society in the death of their former president, Professor B. O. Peirce.

The society voted to express to the director and members of the National Bureau of Standards its high appreciation of the generous hospitality extended to the society throughout the meeting, also to the Washington Section of the American Institute of Electrical Engineers for arranging trips and providing guides to various places of scientific interest in the city and its neighborhood.

The program of scientific papers was as follows: "Solenoids," by C. R. Underhill.